

Original Article

Bone mineral density in patients with pemphigus vulgaris on long-term steroid therapy

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Abstract *Background* Osteoporosis is a common side-effect seen with long term steroid therapy. Patients at increased risk are over 50 years of age, postmenopausal, or have restricted mobility.

Objectives To assess the bone mineral density (BMD) in patients with pemphigus vulgaris (PV) on long term steroid therapy.

Patients and methods All patients with pemphigus vulgaris on oral/parenteral steroid therapy at the Department of Dermatology, Unit I, Mayo Hospital, Lahore were enrolled. Their BMD was measured at the heel with a quantitative ultrasound device. A control group comprising of 20 patients was also taken within the same time period that suffered from skin diseases other than pemphigus vulgaris and were not taking steroids in any form.

Results There were 25 patients, 14 males and 11 females, with an average age of 33.8 years (range 12-60 years). The average duration of PV was 24 months (6 months to 12 years). The steroids used by these patients included prednisolone, betamethasone and dexamethasone. The duration of intake ranged from 2 months to 36 months. The highest dose was 120 mg and lowest was 10 mg. The mean BMD score of the patients was 0.39244 g/cm² and 0.45773 g/cm² for the control group. The mean T-score of the patients was -2.31, score was -2.61 in female patients and -2.08 in males. The score was -1.74 in the control group.

Conclusion All patients requiring long-term glucocorticoid therapy are candidates for osteoporosis prevention.

Key words

Bone mineral density, steroid therapy, pemphigus vulgaris.

Introduction

Systemic glucocorticosteroids (GCS) are the best established therapy for the management of pemphigus vulgaris. Their introduction in the early 1950s resulted in a dramatic fall in

mortality to an average of 30% with complete remission rates of 13-20%.¹ It is important for the dermatologist to have clear guidelines for the clinical use, pharmacology and adverse reactions of GCS. Acute and chronic side-effects of GCS should be well-recognized with an understanding of the hypothalamic-pituitary-adrenal axis. During the course of therapy, physical examination should include all systems. Blood

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chemistries should be performed on a regular basis, including glucose, electrolytes and serum lipids. Osteoporosis is one of the most significant adverse affects to be evaluated, with bone mineral density studies recommended on an annual basis for persons continuing on GCS therapy.²

Glucocorticosteroids induce osteoporosis by suppressing intestinal calcium absorption, decreasing sex hormone production and inhibiting bone formation.³ Approximately one out of five patients treated for one year with 7.5-10 mg of daily prednisolone will develop skeletal fractures. Patients over 50 years of age, postmenopausal or having restricted mobility are at increased risk.⁴ Using quantitative ultrasound, it is possible to measure the ultrasonic characteristics of bone, estimate bone mineral density and assess the risk of future fractures.

The objective of the present study was to assess bone mineral density in patients with pemphigus vulgaris on steroid therapy.

Patients and methods

Type of study Cross-sectional, observational.

Patients From April, 2004 to September, 2004 all patients with pemphigus vulgaris on either oral or parenteral steroid therapy who visited the Department of Dermatology, Unit I, at King Edward Medical University/Mayo Hospital, Lahore were enrolled in the study. The patients were of both sexes and all age groups. A group of 20 patients with other skin disorders were enrolled as control group. This group was not on oral/parenteral

steroids and had not done so in the previous one year.

Methods BMD was measured at the heel (calcaneum) using the quantitative ultrasound device known as *Sahara Bone Sonometer*. During the procedure the patients were seated in a stationary straight back chair, shoes and socks were removed and sides of the heels were cleaned and dried. A pair of soft elastometer pads was brought into contact with opposite sides of the patients' heels by means of a motorized caliper mechanism which is automatically controlled by built-in computer. The examination takes ten seconds to perform. The BMD machine expresses the result as T-score and as an estimate of the BMD in g/cm^2 of the calcaneum. The T-score compares the patient's bone density to the average bone density of young healthy adults of the same gender. If the T-score is between -1.0 through +1.0 the bone mass is normal, if the score is from -2.5 through -1.0 the patient has low bone mass, and there is osteoporosis if the score is from -4.0 through -2.5 (**Figure 1**).

Pearson's product moment correlation was used for correlation analysis and a p of ≤ 0.05 was considered significant.

Results

25 patients with pemphigus vulgaris were enrolled during the specified six months. There were 14 males and 11 females. Their ages ranged from 12-60 years with an average of 33.8 years. The average duration of pemphigus vulgaris was 24 months and ranged from 6 months to 12 years. The various steroids taken by these patients

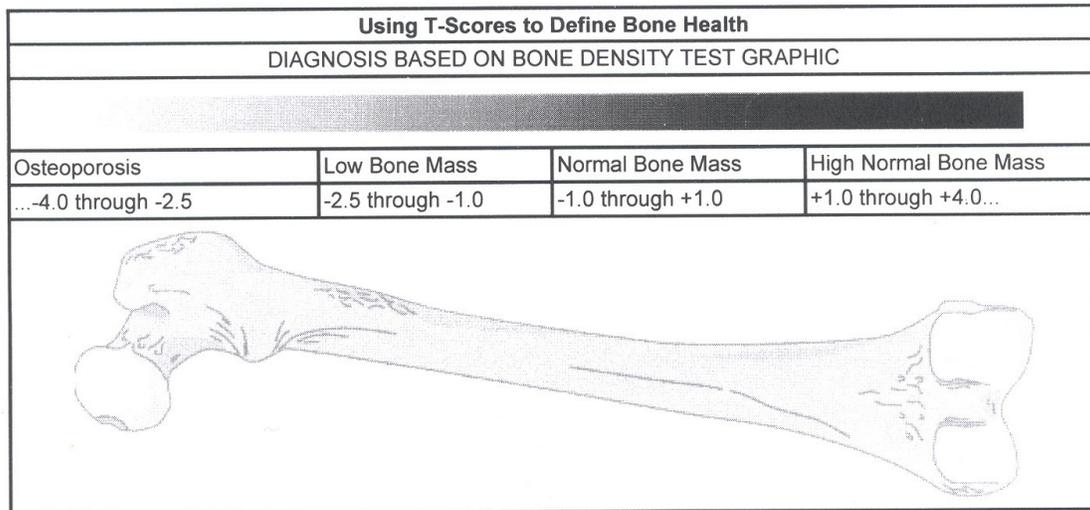


Figure 1 *T-scores are based on statistical measurements called standard deviations (SD) that reflect the difference between one’s bone density and normal bone density in the reference population.

included prednisolone, betamethasone and dexamethasone. The duration of intake ranged from 2 months to 36 months (average 8.6 months). The dose had been as high as 140 mg/day in some patients to as low as 10 mg in patients who had recovered. There were 20 patients in the control group, 7 males and 13 females, with an average age of 44.6 years. These patients had various other skin diseases not requiring oral/parenteral steroid therapy. The average BMD score of the patient group was 0.39244 g/cm² and that of the control group was 0.45773 g/cm². The T-score of the patient group was -2.31 and it correlated with the steroid dose ($p < 0.05$). The average score in female patients was -2.61 and -2.08 in male patients. The score in the control group was -1.74. Both the patient group and the control group had osteopenia but the scores were lower in the patient group ($p < 0.05$).

Discussion

The World Health Organization uses T-score to define normal bone, osteopenia and osteoporosis. The T-score compares patient’s bone density to the average bone density of young healthy adults of the same gender. **Figure 1** shows how T-scores are used to define bone health. Clinically significant bone loss occurs in the vast majority of patients exposed to corticosteroids, and fractures at the spine and hip have been reported with corticosteroid use. Between 30 and 50 percent of patients taking long-term corticosteroids will experience fractures.³ All patients requiring long-term glucocorticoid therapy are candidates for osteoporosis prevention. Lifestyle modifications such as smoking cessation, initiating a weight bearing exercise regimen, and reducing alcohol consumption are encouraged in all patients. Calcium (1,500 mg/day) and vitamin D (800 IU/day) supplementation are also recommended.³

Alternate day dosing of glucocorticoids does not prevent osteoporosis. The lowest possible dose should be used, in order to minimize osteoporosis development. It is important to begin early prevention of the bone loss that occurs with GCS-induced osteoporosis. The 1996 guidelines of the American College of Rheumatology, including adequate calcium and vitamin D intake, should be followed. Hormonal replacement, a bisphosphonate, calcitonin, or a thiazide diuretic may be indicated. Restriction of sodium in the diet is important, as well as adequate potassium intake. The diet should be low in saturated fat and calories and should be high in vegetable protein. Because osteoporosis is so prevalent with GCSs, keeping the patient as active as possible with mild-to-moderate exercise is important. However, if osteoporosis is diagnosed, these measures are not sufficient; medication may be needed to stop further bone loss and to prevent broken bones. The drugs approved for the prevention/treatment of osteoporosis include bisphosphonates (alendronate and risendronate), calcitonin, estrogen and hormone therapy, raloxifene and teriparatide.³

Conclusion

All patients requiring long term glucocorticoid therapy are candidates for osteoporosis prevention.

References

1. Bystryn JC, Steinman NM. The adjuvant therapy of pemphigus. An update. *Arch Dermatol* 1996; **4**: 131-6.
2. Williams LC, Nesbitt LT Jr. Update on systemic glucocorticoids in dermatology. *Dermatol Clin* 2001; **19**: 63-77.
3. American College of Rheumatology Task Force on Osteoporosis Guidelines. Recommendations for the prevention and treatment of glucocorticoid-induced osteoporosis. *Arthritis and Rheumatology* 1996; **36**: 1791-1801.
4. Lester RS, Knowles SR, Shear NH. The risks of systemic corticosteroid use. *Dermatol Clin* 1998; **16**: 277-87.
5. Adachi JD. Corticosteroid-induced osteoporosis. *Int J Fertil Womens Med* 2001; **46**: 190-205.
6. Harman KE, Albert S, Black MM. Guidelines for the management of pemphigus vulgaris. *Br J Dermatol* 2003; **149**: 926-37.